

ART 34 AMDT

PCT/EP03/02307

T 44861/70-gg

5 What is claimed is:

1. Process for the production of short cooking time rice characterized in that hulled rice of at least 10 %, preferably (11-13) %, moisture content, arranged in bags filled with said hulled rice, is microwave heat treated in an apparatus comprising a microwave furnace having a tunnel, for (1 to 30) minutes, preferably for (1 to 12) minutes, further preferably for (3 to 5) minutes continuously by equal or interrupted by alternating microwave treatment, to reach maximum 130°C, wherein said hulled rice is treated with (0.05-4) W, preferably (0.3-2) W, further preferably 0.25 W, microwave power per gram hulled rice, and wherein said microwave treatment is done with microwaves of a frequency between 300 MHz and 10 GHz, preferably with 2450 MHz.
2. Process according to claim 1, characterized in that the microwave exposure related to the mass unit of rice on steady or alternating capacity value (W/g).
- 2.3 Process according to claim 1, characterized in that said hulled rice is packed in polyethylene air-proof bags or coated paper bags before the microwave treatment.
- 2.4 Process according to claim 1, characterized in that said hulled rice is packed in perforated bags used for ready cooking, preferably in perforated polyethylene bags before microwave treatment.

ART 34 AMDT

- 4.5 Process according to claims 1 to 4, characterized in that said hulled rice is microwave treated by a (1-10) cm, preferably (3-7) cm layer thickness.
- 5.6 Process according to claims 1 to 5, characterized in that said hulled rice is treated continuously by 1.5 W/g microwave radiation for (1-6) minutes, preferably for 3 minutes.
- 6.7 Process according to claims 1 to 5, characterized in that said hulled rice is treated in an interrupted way by 1.5 W/g microwave radiation (1-6 times), preferably three times (0.5-2) minutes, and between treatments there are (5-30) seconds, preferably 10 seconds breaks.
- 7.8 Process according to claims 1 to 5, characterized in that said hulled rice is treated by 0.75 W/g microwave radiation for (1-4) minutes, and then by 1.5 W/g microwave radiation for (1-5) minutes.
- 8.9 Process according to claims 1 to 7, characterized in that said hulled rice is treated by 0.3 W/g microwave radiation for (10-16) minutes, preferably for (10-12) minutes.
- 9.10 Process according to claims 1 to 9, characterized in that said hulled rice packed in a number of perforated bags and staged one above the other are moved by means of a conveyor means through said tunnel provided in said microwave furnace, wherein in the tunnel there is generated a special wet atmosphere of (85 to 99)°C, preferably (90 to 95)°C, in the surrounding of the said rice bags.
- 10.11 Process according to claim 10, characterized in that said hulled rice in the perforated bags has a temperature of (80 to 120)°C, preferably (105 to 108)°C, wherein the temperature may be higher or lower depending on the pressure of the chamber atmosphere of the microwave treatment means.

ART 34 AMDT

11. Apparatus for the production of short cooking time rice comprising a microwave furnace, characterized in that in the microwave furnace (16) there is mounted a tunnel (38) made from a suitable material, wherein the hulled rice packed into bags is movable within the tunnel (38) by means of a conveyor means, wherein the tunnel (38) is provided with a top area element (48) which is adapted for collection of condensed water and steam, respectively, and wherein the tunnel (38) is provided with a bottom area element (42) which is formed with apertures (54) or with a perforation or with channels for distribution of remaining condensed water and steam, respectively.
- 10
12. Apparatus according to claim 11, characterized in that said tunnel (38) is made from ceramic material, plastic material, quartz glass.
- 13
- 15 14. Apparatus according to claim 12, characterized in that said top area element (48) is formed in roof-like way, preferably angled or curved respectively semi-circular.
- 20
15. Apparatus according to claims 12, characterized in that said top area element (48) is provided with a collecting means for collecting drops of condensed water or steam, respectively.
16. Apparatus according to claims 12, characterized in that said top area element (48) is provided with a cooling means for a better generation of condensation.
- 25
17. Apparatus according to claims 12 to 16, characterized in that the volume ratio of said tunnel (38) and the volume of the rice packed in a number of bags (14) is preferably 3:1.

ART 34 AMDT

18. Apparatus according to claims 12 to 17, characterized in that said tunnel (38) and/or the microwave furnace (16) are insulated to prevent heat losses.
19. Apparatus according to claims 12 to 18, characterized in that said tunnel (38) is equipped with an additional heating means.
5
20. Apparatus according to claim 19, characterized in that said additional heating means comprises at least one heating element and/or hot air.
- 10 21. Apparatus according to claims 12 to 20, characterized in that said tunnel (38) is equipped with a channel system for a heating medium, preferably hot-air, for heating the tunnel (38).
22. Apparatus according to claims 12 to 21, characterized in that said microwave
15 furnace (16) is connected with a conduit means (26) which is provided with a heat exchange means (24) of a combustion engine (22) which is connected with a generator (20) provided for the generation of energy for the microwave furnace (16).
- 20 23. Apparatus according to claim 22, characterized in that said conduit means (26) is connected with a fan (32).
24. Apparatus according to claims 22 or 23, characterized in that said conduit means
25 (26) is provided with a filter element (34).
25. Apparatus according to claim 24, characterized in that said combustion engine is replaced by a solar heat exchanger.